JMKSP (Jurnal Manajemen, Kepemimpinan, dan Supervisi Pendidikan)
Volume 8 (1) 2023, 620-630
E-ISSN 2614-8021, P-ISSN 2548-7094

The Effect of Constructive and Independence Play on Prior Knowledge of Mathematics

Resti Elma Sari[1], Hendri Budi Utama[1]
[1]Universitas Negeri Padang, Indonesia

Corresponding author e-mail: restielmasari@fip.unp.ac.id

Article History: Received on 22 April 2023, Revised on 24 June 2023, Published on 30 June 2023

Abstract: This study aims to investigate the impact of constructive play and the level of independence on prior knowledge of mathematics. The research method used is experimental. The research findings show that there is an effect of constructive play and the level of independence on early mathematical knowledge. In addition, there is also an interaction between constructive play and the level of independence towards early mathematical knowledge. In the group of children with a high level of independence, the use of Cuisenaire block constructive games resulted in higher initial mathematical knowledge compared to the group of children who were given geometric puzzle constructive games. On the other hand, in the group of children with a low level of independence, the early mathematical knowledge of the children who were given the Cuisenaire block constructive game was lower than the group of children who were given the geometric puzzle constructive game. Therefore, the Cuisenaire block constructive game is suitable for children with a high level of independence, while the geometric puzzle constructive game is more suitable for children with a low level of independence.

Keywords: Constructive Play, Independence, Mathematics

A. Introduction

The mission of Early Childhood Education in Indonesia is to promote the optimal growth and development of children and to better prepare them for basic education. Governments and society continue to strive to expand and improve the quality of Early Childhood Education. Early childhood growth and development should aim to lay the foundation for all human growth and development (Mansur, 2013). For children to demonstrate optimal achievement and curiosity, the early learning process requires efforts to convey meaningful basic concepts through real life experiences (Semiawan, 2017). This is in line with early childhood education learning principle for aged 4-6 year old preschoolers, "playing while learning, learning while playing". Play activities that provide stimulation according to the child's developmental stage are expected.

Through playful activities, children can explore their existing knowledge and express their creativity without being forced. One of the games that can motivate children to familiarize themselves with early math concepts is the use of constructive

games. It is a play media that directly engages children and makes learning mathematics more interesting for them. Mathematics is a way of representing the world and what is experienced in it, and mathematics is used to solve everyday life problems. Mathematics is about understanding numbers, functions and relationships, probabilities and measurements (Brewer, 2017).

In fact, mathematics is a subject that receives a lot of attention from educators, parents and students. However, many kindergarten children find it difficult to master early mathematical concepts. This could be due to several factors, one of which is the lack of educational games in mathematics. Teachers often impart math knowledge to children verbally without giving concrete examples, and children are usually given assignments using Children's worksheets. In class management, teachers do not actively involve children in learning process. Children become more passive because the teacher dominates the class.

In this case, the learning media used must match the child's characteristics for suboptimal results. In addition, basic knowledge of mathematics and self-employment are also relevant. Independence is the behavior of directing activities yourself, without expecting guidance from others, and without seeking help from others and trying to solve problems (Touhill, 2013). Independent children are able to carry out their own activities without the help of others, make their own decisions, take responsibility and self-confidence, and take the initiative to interact in social environments. This makes it easier for children to acquire early math knowledge.

Based on this, active activities are needed to develop children's early math knowledge. One of the active learning media in forming early math knowledge is through constructive games. Constructive games are games that are goal oriented, where children use objects or materials to create or construct something (Roopnarine, J. L dan Johnson, 2015). The variety of constructive games that are suitable for use in early childhood include cuisenaire blocks and geometric puzzles. The Cuisenaire block is a block created by George Cuisenaire with the principle of using Cuisenaire blocks to help children master early mathematical knowledge in performing basic arithmetic operations (concepts of addition, subtraction, multiplication and division of integers) (Sundaya, 2013). Any of a set of colored rods usually of 1 centimeter cross section and of 10 lengths from 1 to 10 centimeters that are used for teaching number concepts and the basic operations of arithmetic (Merriam, n.d.).

Furthermore, the geometry puzzle is a game of arranging geometric shaped pieces to form a complete shape. In playing geometry puzzles, accuracy is needed, children will be trained in their ability to concentrate, because children need to focus when assembling geometric pieces into a complete and intact shape (Semiawan, 2017). Playing geometric puzzles provides benefits such as training the brain, practicing problem solving skills, training hand and eye coordination, helping to recognize geometric shapes, training reasoning skills and patience, and providing knowledge about colors, shapes, and concepts of objects around them (Yulianti, 2019).

Through constructive play of cuisenaire blocks and geometry puzzles children can specifically identify numbers through colors, perform measurements, and classify through fun activities. Thus, it can be assumed that constructive play has an effect on

children's early mathematical knowledge. Based on observations in several kindergartens in North Padang District, Padang City, it was found that teachers focused more on Group B Kindergarten children to master early mathematical knowledge through conventional methods and minimal use of mathematical educational games.

In an interview with a teacher at the kindergarten Lab school UNP, the teacher said it was very difficult to implement constructive play due to the teacher's lack of media skills. As reflected, it turns out that there are several children whose basic math knowledge are not at their peak, namely: gives the result of addition and subtraction, has experience with symbols "+", "-", "=", measurements of objects, detect differences based on size "greater than", "less than", "most", sort objects into the same or similar groups, and classify objects based on color, shape and type (3 variations). Based on these questions, researchers are interested in knowing the effects of constructive play and autonomy on children's early math knowledge.

There are several related studies to this study, the first of which was 2022 has been carried out by Suci Aulia Sari and Puji Yanti Fauziyah entitled The Effect of Constructive Games and Science Experiments on the Creativity of Children Aged 5-6 Years. The results of this study found that there were differences in creativity in children who participated in constructive games and science experiments. Through the results of this study, an effective game and experiment can be obtained to increase the creativity of early childhood (Sari & Fauziyah, 2022).

The second study was a 2012 experimental study by Jhoni Warmansyah and Amalina 2019 The Influence of Constructive Games and Visual Spatial Intelligence on Early Childhood Mathematical Abilities. The purpose of this study is to determine the effect of constructive play and visual spatial analysis on early mathematical abilities. The results of this study were that early childhood treated with Lego constructive play had higher early math skills than block constructive play. There is an interaction between constructive play and visual spatial intelligence, in general it has a significant effect on the early math abilities of group B kindergarten children. Children who have high visual spatial intelligence, treated with Lego constructive games have higher initial mathematical abilities than using block constructive games. Children who have low visual-spatial intelligence who are given constructive games with blocks have higher initial mathematical abilities than those who are treated using lego constructive games (Warmansyah & Amalina, 2019).

The third study was conducted by Septiyana, Fitrianna kultum, et al 2018, titled "Subsequent research from tested the Influence of Board Games on Mathematic Ability In The Introduction of The Concepts Addition and Subsription in Children Aged 5-6 Years. The results of the study show that there is an effect of board games on mathematical ability in introducing the concept of addition and subtraction to children aged 5-6 years (Septiyani et al., 2018).

The fourth study was an experimental study by Ni Kadek Indra Yanti in 2014 entitled "Effects of Creative Active Games on Acquisition of Early Mathematical Concepts". The objective of this research is to identity the influence of an active games and the level of creativity on the understanding of early mathematics concept. The

research is using experimental research. The research found that there is a significant difference between the understanding of early mathematics concept between the kids that were given constructive and free games; interaction is exist between the active game and the level of creativity on the understanding of early mathematic concept; kids that have high level of creativity will significantly have a higher early mathematics concept if being given constructive game than free game; kids with lower level of creativity will significantly have a higher early mathematics concept if being constructive game than free game (Yanti, 2014).

The fifth study was in 2011, titled "Measurement of Preschool Children's Comprehension of Early Mathematical Concepts," by Amanda Vanderheyden, Carmen Broussard, Patricia Snyder, Jamie George, Sarah Meche Lafleur, and Candy conducted by S. Williams. As a result of this research, the mathematics knowledge that children need to understand is not only limited to early arithmetic skills such as counting, identifying numbers, and sequences, but also understanding number concepts, measuring shapes and sizes, etc. It concluded that there is also a focus on children's understanding pattern (VanDerHeyden et al., 2011).

The sixth research by Munif, Muhammad, et al 2022 Implementation of Number Block Game Techniques for Learning Number Symbol in Early Childhood The purpose of this study is how the number block game technique is used to recognize number symbols in children aged four to five years. This type of research is qualitative-descriptive using a case study approach. The results showed that using the number block game can create a fun learning atmosphere, make it easier for children to absorb learning material, especially in recognizing number symbols, and make children feel happy and at ease. The teacher ensures that the learning objectives are met during the learning activities. The findings of this study indicate that the use of number block game techniques to improve the ability to recognize number symbols in children aged four to five years can be carried out effectively and efficiently (Munif et al., 2022).

The seventh research in 2021 that has been conducted by Rahmatia, et al. entitled Development of Constructive Play Models with Block Media to Improve Children's Visual-Spatial. The results of this study found that through the constructive play model with block media it can be stated that the product developed is valid and practical. This is shown from the assessment of the two validators on the product of developing children's visual-spatial abilities with the acquisition of an average score given by the validator fulfilling the validity criteria while it is declared practical because the learning components developed can be carried out in the field based on the validator's assessment (Rahmatia et al., 2021).

The eighth research in 2020 was carried out by Jenny Nugraheni Irawan and Fitriani entitled The Effect of Tangram Constructive Games on Creative Thinking in Elementary School Students. The purpose of this study was to determine the effect of constructive tangram games on creative thinking in elementary school students. The hypothesis of this study: there is a significant effect of tangram constructive play on creative thinking before and after the intervention. The results showed that there was

a significant effect of tangram constructive play before and after the intervention (Irawan et al., 2020).

The ninth study in 2018 was an experimental research conducted by Meta Br Ginting entitled Building Early Childhood Knowledge Through Constructive Games Based On The Perspective Of Theory Of Piaget. The results of this study found that by playing constructively children gain knowledge through the process of assimilation and accommodation so as to help children form new schemes based on the experience gained and produce knowledge (Ginting, 2018).

The tenth study in 2017 was an experimental research conducted by Gilar Gandana, et al entitled Improving The Ability To Recognize Symbols Of Numbers 1-10 Through Cuisenaaire Block Media In Children Aged 4-5 Years At-Toyyibah Kindergarten. The results of this study found that cuisenaire block media could improve the ability to recognize number symbols 1-10 in children aged 4-5 years at Kindergarten At-Toyyibah, Sukarame District, Tasikmalaya Regency (Gandana et al., 2017).

The twelfth research in 2021 is an experimental research conducted by Raudah, et al entitled The Effect of Number Block Games on the Counting Ability of Children Aged 5-6 Years at PAUD Marqisah. The results of this study indicate that there is an effect of the number block game on the numeracy skills of children aged 5-6 years at PAUD Marqisah, Segamit Semende Datar Ulu Muara Enim Village (Raudah et al., 2021).

Finally, we present the 2015 study "Making Early Math Education Work for All Children" by Karen C. Fuson, Douglas H. Clements, and Julie Salama. The results of this study concluded that designing early childhood mathematics learning experiences focuses on identifying fundamental substantive goals that children can achieve.Numeric. Includes all numbers, relationships, and operations (arithmetic). Geometry, spatial relations, measurement. When designing early childhood math learning experiences, it is important to ensure that the experiences are meaningful and repetitive so that children learn deeply (Fuson et al., 2015).

B. Methods

This study generally aims to get an overview of the early mathematics knowledge of group B kindergarten children in the city of Padang. This research was conducted in 2 kindergartens in North Padang District, Padang City which were used as samples, namely kindergarten Labschool UNP and kindergarten Kartika I-63. The method used in this study is an experimental method with a treatment by level 2 x 2 design, namely an experimental design for 2 groups. Intended to test whether there is an effect of giving different treatments to each experimental group. This study uses a type of treatment, namely by providing constructive games. The constructive games used are Cuisenaire blocks and geometry puzzles. Constructive games of Cuisenaire blocks were given to group B kindergarten Labschool UNP as an experimental class consisting of 14 children and geometric puzzle constructive games were given to children in group B kindergarten Kartika I-63 consisting of 14 children. Treatment for both groups will be given directly by the researcher and also the teacher (collaborator).

Data collection techniques are carried out using primary and secondary data collection. After the data is collected, it is then analyzed using the normality test and homogeneity test to test the hypothesis (Sugiyono, 2021).

C. Results and Discussion

This study uses two-way analysis of variance (ANOVA) to test the hypothesis. The treatment variables determine the two main effects between columns (main effects) and the attribute variables determine the two main effects between rows (main effects). Interaction effects (main effects) between columns and rows and between the independent variables child autonomy and constructive play were also found in group B kindergarten children. The linked table summarizes the results of the two-way ANOVA calculations.

Table 1. Summary of re sults of two-way ANOVA calculations

Source Variance	JK	Db	RJK	F-count	F_{tab} α = 0,05	α = 0,01	Inference
Inter A	96,57	1	96,57	22,10	4,26	7.82	Significant
Inter B	19,43	1	19,43	4,45	4,26	7.82	Significant
Interaction A x B	240,14	1	240,14	54,96	4,26	7.82	Significant
Inside	104,86	24	4,37	-	-	-	-
Total	461	27	-	-	-		-

Based on the two-way analysis of variance (ANOVA) results above, the hypothesis test can be explained as follows.The analysis results show that the value of F(OA) is 22.10. From the G-list table with db(A)/db(D) = 1/24 and α = 0.05 we find the value of Ftable = 4.26. Because F(OA) = 22.10 > Ftable = 4.26. This means that H1 is accepted and H0 is rejected. Thus, there was no difference in the mean ratings of early math skills between the group of children given constructive games with cooking blocks and the group of children given constructive games with geometry puzzles. occur. Furthermore, the results of the analysis show that the value of F(OB) = 4.45. From the G-list table with db(A)/db(D) = 1/24 and α = 0.05 we find the value of Ftable = 4.26. Since F(OB) = 4.45 > Ftable = 4.26, this means that H1 is accepted and H0 is rejected. Thus, there is a difference in average ratings of early mathematics skills between groups of highly independent children and those of less independent children. Based on the results of our analysis, we find that the value of F(OAB) is 54.96. From the G-list table with db(A)/db(D) = 1/24 and α = 0.05 we find the value of Ftable = 4.26. Since F(OAB) = 54.96 > Ftable = 4.26, this means her H1 is accepted and H0 is rejected. Thus, there is a significant interaction effect on children's early mathematics knowledge between factor A (constructive play) and factor B (independence).

Based on the results of this analysis, the result of the difference can be said to be significant and should be tested further using Tukey's test. A summary of Tukey test results is shown in Table 2 below.

Table 2. Summary of Tukey test calculation results for basic mathematics at Lab School UNP Kindergarten and Kartika I-63 Kindergarten in Padang City

Group	N	Q_{hitung}	Q_{table} α = 0,05	Inference
$A_1 B_1$ - $A_2 B_1$	7	12,11	3,34	Significant
$A_1 B_2$ - $A_2 B_2$	7	-2,14	-3,34	Significant

Based on the results of subsequent test calculations with the Tukey Test, it can be concluded that the value of QcountA1B1-A2B1 = 12.11. From the Critical Values Of Q (Tukey) table with α = 0.05, k = 2 and n = 7 it is known that the value of Qtable (0.05; 2; 7) = 3.34. Because QcountA1B1-A2B1 = 12.11 > Qtable = 3.34. Then H0 is rejected, so H1 is accepted. Thus, the early mathematical knowledge of children who were given a Cuisenaire block constructive game with high independence was higher than the group of children who were given a geometric puzzle constructive game that had high independence.

In addition, based on the results of the analysis it is known that the value of Qcount is A1B2-A2B2 = -2.14. From the table Critical Values Of Q (Tukey) table with α = 0.05, k = 4 and n = 7 it is known that the value of Qtable (0.05; 4; 7) = -3.34. Because QcountA1B2-A2B2 = -214 > Qtable = 4.68 or rejects H0, the early mathematical knowledge of children who are given a constructive game of Cuisenaire blocks that has low independence is lower than the group of children who are given a constructive game of geometric puzzles that has low independence.

After analyzing the data using the analysis of variance approach (ANOVA) and continuing with the Tukey test, the discussion of the results of the study will be focused on the four hypotheses that have been tested for validity. Based on the group given the constructive game Cuisenaire blocks, it was obtained x = 49.07 and in the group given the constructive game puzzle geometry, it was obtained x = 45.36, so the average difference was 3.71 points. This shows that constructive play has an effect on children's early mathematical knowledge. This is based on Piaget's opinion which says that children gain knowledge through constructive play, not from information obtained from their environment, but through a construction process that will renew children's understanding (Carol, 2017).

The results of the two-way test of the second hypothesis of ANOVA show that there is an interaction effect between construction games and prior knowledge of mathematics. It can be said that the influence of constructive play on early math skills depends on the child's independence. The effect of this interaction is reflected in the results of hypothesis testing as shown below:

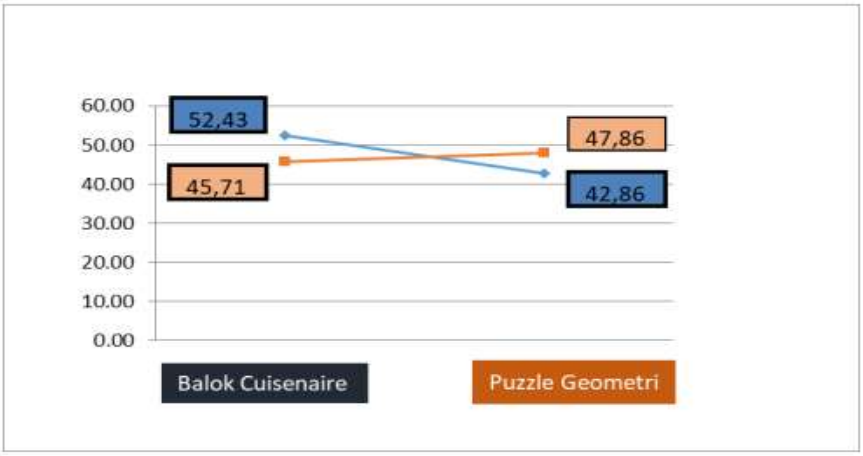

Figure 1. Interaction of Constructive and Independent Games on Early Mathematical Knowledge

Based on the picture above, it can be seen that the results of the initial mathematical knowledge of the group of children with high independence who were given a constructive game of Cuisenaire blocks were higher than the group of children with high independence who were given a constructive game of geometric puzzles. Independence is the need to be free from the control of others, the behavior of people who struggle to make decisions, rely on themselves, and achieve goals without the help of others (Feist, Jess dan Feist, 2018). In addition, that constructive play is an activity that uses various existing objects to produce a particular work.

The results of the third hypothesis test rejected the null hypothesis which stated that the group of children who had high independence who were given the Cuisenaire block constructive game treatment was lower than the group of children who were given geometric puzzle constructive games. As previously explained, this is supported by data on the average difference, x = 52.43 in the group of children who have high independence and are given constructive play with Cuisenaire blocks. Meanwhile, the group of children who had high independence and were given a constructive game of geometric puzzles obtained x = 45.71. In addition, the results of the Tukey test analysis show that Qcount A1B1-A2B1 = 12.11 > Qtable = 3.34. That is, QcountA1B1-A2B1 > Qtable at a significance level of α = 0.05. The Cuisenaire block is an educational game tool consisting of a set of pieces of blocks with a specific color and size that serves as a tool for developing children's early mathematical knowledge, especially the ability to count, number recognition and provides opportunities for early childhood to recognize the environment so that it helps children to recognize its advantages (Cucu, 2015). Geometry puzzle is a game of arranging and matching shapes according to the actual picture (Yulianti, 2019). Thus, it can be concluded that children with high independence who are given a constructive game of Cuisenaire blocks have higher initial mathematical knowledge compared to children with high independence who are given a constructive game of geometric puzzles.

Based on the results of the Tukey test which compared children who were given constructive play with Cuisenaire blocks applied to children who have low

independence with those who were given constructive games of geometric puzzles, the results obtained were QcountA1B2-A2B2 = -2.14 > Qtable = -3.34 or Qcount > Qtable at a significant level α = 0.05. Then H0 is rejected. The negative sign indicates that there is a negative relationship between children who are given Cuisenaire block constructive games with low independence and children who are treated with geometric puzzle constructive games with low independence. This means that the group of children who were given the geometric puzzle constructive game had higher initial mathematical knowledge than the group of children who were given the Cuisenaire block constructive game.

Thus it can be concluded that the initial mathematical knowledge was higher in the group of children who were given a constructive game of geometric puzzles compared to the group of children who were given a constructive game of cuisenaire blocks in the group of children who had low independence. Children with low independence show characteristics such as: showing reluctance in learning, lack of initiative, distrust in expressing opinions, and often asking for help from teachers and friends in carrying out activities (Touhill, 2013).

Characteristics like this when given a constructive play Cuisenaire blocks that emphasize the independence, initiative, and self-confidence of each individual, it will have less influence on them. Constructive games using Cuisenaire blocks can have a positive impact on children who are in the high independence category, learning using Cuisenaire blocks constructive games, but less effective for children with low levels of independence. A child's initial math knowledge will increase if accompanied by high independence, and conversely, poor results, if the child's independence is low.

D. Conclusion

Based on the results of the research analysis and discussion, it can be concluded that the initial mathematical knowledge is higher in the group of children who are given the Cuisenaire block constructive game compared to the group of children who are given the geometric puzzle constructive game. This is based on the results of two-way ANOVA calculations showing that Fcount = 22.10 > Ftable = 4.26 at a significant level α = 0.05, so rejecting H0 is rejected and accepting the alternative hypothesis H1. There is an interaction between constructive play and independence towards the early mathematical knowledge of group B Kindergarten children. This is based on ANOVA calculations. The interaction results obtained with A X B show that H0 is rejected, based on F(OAB) = 54.96. From the G-list table it is known that the value of Ftab = 4.26. with db(A)/db(D) = 1/24 and α = 0.05 Because F(OAB) = 54.96 > Ftab = 4.26 then H0 is rejected.

The early mathematical knowledge of the group of children with high independence who were given the Cuisenaire block constructive game was higher than the initial mathematical knowledge of the group of children who were given the geometric puzzle constructive game. This is based on the calculation results of the Tukey Test, QcountA1B1-A2B1 = 12.11 > Qtable = 3.34. Thus, H0 is rejected. The early mathematical knowledge of the group of children with low independence who were given the Cuisenaire block constructive game was lower than the initial mathematical

knowledge of the group of children who were given the geometric puzzle constructive game. This is based on the calculation of the Tukey Test, QcountA1B2-A2B2 = -2.14 > Qtable = -3.34 or Qcount > Qtable at a significance level of α = 0.05, Thus, H0 is rejected. The minus value indicates that the effect is lower. To optimize the mastery of early mathematical knowledge, children with high independence should use Cuisenaire block constructive games, while children with low independence should use geometric puzzle constructive games.

Reference

Brewer, J. A. (2017). *Introduction to Early Childhood Education, Preschool Through Primary Grades*. Pearson Education Inc.

Cucu, E. (2015). *Pemilihan dan Pengembangan Sumber Belajar untuk Anak Usia Dini [Selection and Development of Learning Resources for Early Childhood]*. Depdiknas.

Feist, Jess dan Feist, J. G. (2018). *Theories of Personality*. Pustaka Pelajar.

Fuson, K. C., Clements, D. H., & Sarama, J. (2015). Making early math education work for all childrenmaking early math education. *Phi Delta Kappan*, *97*(3), 63–68. https://doi.org/10.1177/0031721715614831

Gandana, G., Pranata, O. H., & Yulia Danti, T. Y. (2017). Peningkatan Kemampuan Mengenal Lambang Bilangan 1-10 melalui Media Balok Cuisenaire pada Anak Usia 4-5 Tahun di TK At-Toyyibah [Increasing the Ability to Recognize Number Symbols 1-10 through Cuisenaire Block Media in Children Aged 4-5 Years at At-Toyyibah Kindergarten]. *Jurnal Paud Agapedia*, *1*(1), 92–105. https://doi.org/10.17509/jpa.v1i1.7160

Ginting, M. B. (2018). Membangun Pengetahuan Anak Usia Dini Melalui Permainan Konstruktif Berdasarkan Perspektif Teori Piaget [Building Early Childhood Knowledge Through Constructive Play Based on Piaget's Theory Perspective]. *Jurnal Caksana : Pendidikan Anak Usia Dini*, *1*(02). https://doi.org/10.31326/jcpaud.v1i02.190

Irawan, J. N., Nanda Priyatama, A., & Fitriani, A. (2020). Pengaruh Permainan Konstruktif Tangram terhadap Berfikir Kreatif pada Siswa Sekolah Dasar [The Influence of Tangram Constructive Games on Creative Thinking in Elementary School Students]. *Jurnal Intervensi Psikologi (JIP)*, *12*(1), 37–50. https://doi.org/10.20885/intervensipsikologi.vol12.iss1.art4

Mansur. (2013). *Pendidikan Anak Usia Dini dalam Islam [Early Childhood Education in Islam]*. Pustaka Pelajar.

Munif, M., Sali, M., Fajri, Z., Mahmuda, M., & Farlina, T. (2022). Implementation of Number Block Game Techniques for Learning Number Symbol in Early Childhood. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(4), 3449–3459. https://doi.org/10.31004/obsesi.v6i4.2074

Rahmatia, R., Pajarianto, H., Kadir, A., Ulpi, W., & Yusuf, M. (2021). Pengembangan Model Bermain Konstruktif dengan Media Balok untuk Meningkatkan Visual-Spasial Anak [Development of a Constructive Play Model using Block Media to Improve Children's Visual-Spatial]. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(1), 47–57. https://doi.org/10.31004/obsesi.v6i1.1185

Raudah, R., Amilda, A., Sofyan, F. A., & Marlina, L. (2021). Pengaruh Permainan Balok Angka Terhadap Kemampuan Berhitung Anak Usia 5-6 Tahun di PAUD Marqisah [The Influence of the Number Block Game on the Numeracy Ability of Children Aged 5-6 Years at PAUD Marqisah]. *Zuriah : Jurnal Pendidikan Anak Usia Dini*, *2*(2), 119. https://doi.org/10.29240/zuriah.v2i2.3588

Roopnarine, J. L dan Johnson, J. E. (2015). *Pendidikan Anak Usia Dini dalam Berbagai Pendekatan [Early Childhood Education in Various Approaches]*. Kencana Prenada Media Group.

Sari, S. A., & Fauziyah, P. Y. (2022). Pengaruh Permainan Konstruktif dan Percobaan Sains terhadap Kreativitas Anak Usia 5-6 Tahun [The Influence of Constructive Games and Science Experiments on the Creativity of Children Aged 5-6 Years]. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(4), 2453–2461. https://doi.org/10.31004/obsesi.v6i4.1977

Semiawan, C. (2017). *Perkembangan dan Belajar Peserta Didik [Student Development and Learning]*. UNY.

Septiyani, F. K., Rintayati, P., & Istiyati, S. (2018). Pengaruh Board Games terhadap Mathematic Ability dalam Pengenalan Konsep Penjumlahan dan Pengurangan pada Anak Usia 5-6 Tahun [The Influence of Board Games on Mathematical Ability in Introducing the Concept of Addition and Subtraction in Children Aged 5-6 Years]. *Kumara Cendikia: Jurnal Penelitian Pendidikan Anak Usia Dini*, *6*(4), 1–9.

Sugiyono. (2021). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D [Educational Research Methods: Quantitative, Qualitative, and R&D Approaches]*. Alfabeta.

Sundaya, R. (2013). *Media Pembelajaran Matematika [Mathematics Learning Media]*. Alfabeta.

Touhill, L. (2013). *Promoting Independence and Agency*. NQS PLP.

VanDerHeyden, A. M., Broussard, C., Snyder, P., George, J., Lafleur, S. M., & Williams, C. (2011). Measurement of kindergartners understanding of early mathematical concepts. *School Psychology Review*, *40*(2), 296–306. https://doi.org/10.1080/02796015.2011.12087719

Warmansyah, J., & Amalina, A. (2019). Pengaruh Permainan Konstruktif dan Kecerdasan Visual- Spasial Terhadap Kemampuan Matematika Awal Anak Usia Dini [The Influence of Constructive Play and Visual-Spatial Intelligence on Early Mathematics Abilities in Early Childhood]. *Math Educa Journal*, *3*(1), 71–82. https://doi.org/10.15548/mej.v3i1.270

Yanti, N. K. I. (2014). Pengaruh permainan aktif kreativitas pada penguasaan konsep matematika awal [The influence of active creative play on the mastery of early mathematical concepts]. *Jurnal Pendidikan Usia Dini*, *8*(1), 8.

Yulianti, R. (2019). *Permainan yang Meningatkan Kecerdasan Anak [Games that Increase Children's Intelligence]*. Laskar Askara.